

# **Study Guide**

**For**

## **West Virginia Underground Storage System Closure and Change-in-Service Certification (Class B)**

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## **Suggestions for Using This Study Guide**

This study guide is intended to help you prepare for West Virginia's Underground Storage Tank Class B Underground Storage System Closure and Change-in-Service Exam. The study guide consists of an extensive list of questions together with the documents in which the answers to the questions can be found. All of the questions from a specific document are grouped together in the study guide. After each question, the document section or page number where the answer can be found is given in parentheses. The process of reading the question, finding the answer, and writing the answer in your study guide will help you learn and remember the information you need to know to pass the certification examination.

The actual certification exam will include only the material covered in these study questions. The only difference is that the exam will be in multiple choice format. The exam will be open book. During the examination, you may refer to this study guide and any other reference materials that you wish. You are cautioned, however, that you will not have sufficient time to look up the answers to the exam questions. You should be thoroughly familiar with the materials in this study guide before you take the examination.

The study guide is based on industry publications and manufacturers' literature. The use of these documents does not constitute endorsement of specific products by the West Virginia Department of Environmental Protection. These documents are used here as representative, authoritative sources of information regarding the proper closure or change-in-service of underground storage systems.

**Suggested Study Guide Documents for the West Virginia  
Underground Storage System Closure and Change-in-Service Exam  
(Class B Worker Certification)**

**Study Documents**

New England Interstate Water Pollution Control Commission  
*"Tank Closure without Tears: An Inspection's Safety Guide"*

*API 1604* - Closure of Underground Petroleum Storage Tanks, 3rd Edition

API 2016 - Guidelines and Procedures for Entering and Cleaning  
Petroleum Storage Tanks

NIOSH — Working in Confined Spaces (Publication 80-106)

OSHA — *Excavation Rules 29CFR 1926, Subpart P, 650-652*  
*(including Appendix A, B, and F)*

*OSHA - Permit Required Confined Spaces, 29 CFR 1910.146, Subpart J*

West Virginia — Underground Storage Tank Rules (Title 33 Series 30)

Federal Underground Storage Tank Regulations:  
(40 CFR 280/0 — 280.74)

Appendix D-2 UST/LUST Closure Guidance Memo

It is highly recommended that you obtain a copy of each of the study guides to review prior to taking the examination. Some of the study guides are free publications, and are being provided as a courtesy to you by the WVDEP. For study guides that must be purchased, we have included information on where they can be obtained. Please note that information on purchasing study guide materials may change at any time. For this reason, the purchasing information provided may not be correct. **It is the sole responsibility of the applicant to obtain the necessary study guide materials to prepare for this exam.**

New England Interstate Water Pollution Control Commission  
*"Tank Closure without Tears: An Inspection's Safety Guide"*  
-Free document, provided by WVDEP

API 1604 - Closure of Underground Petroleum Storage Tanks, 3rd Edition  
-Must be purchased, One option is the HIS Standards Store at <http://globalihs.com> enter API 1604 to search for document

API 2016 - Guidelines and Procedures for Entering and Cleaning Petroleum Storage Tanks  
-Must be purchased, One option is the HIS Standards Store at <http://global.ihs.com>, enter API 2016 to search for document

NIOSH — Working in Confined Spaces (Publication 80-106)  
-Free document, provided by WVDEP

OSHA — *Excavation Rules 29CFR 1926, Subpart P, 650 - 652 (including Appendix A, B, and F)* -Free document, provided by WVDEP

OSHA - *Permit Required Confined Spaces, 29 CFR 1910.146, Subpart J*  
-Free document, provided by WVDEP

West Virginia — Underground Storage Tank Rules (Title 33 Series 30)  
-Free document, provided by WVDEP

Federal Underground Storage Tank Regulations:  
(40 CFR 280.70 — 280.74)  
-Free document, provided by WVDEP

Appendix D-2 UST/LUST Closure Guidance Memo  
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## **“Tank Closure Without Tears: An Inspection’s Safety Guide”**

**(New England Interstate Water Pollution Control Commission  
{NEIWPCC}, 1988, Reprinted 1990)**

*(Study Guide Questions for West Virginia Underground Storage Tank Closure and Change-in-Service Exam)*

1. What are the three points of the basic fire triangle? (NEIWPCC, p. 2)
  
  
  
  
  
  
  
  
  
  
2. How many points of the fire triangle are necessary to support combustion?  
(NEIWPCC, p. 2)
  
  
  
  
  
  
  
  
  
  
3. Is any type of electrical or internal combustion equipment safe to use during tank closure? If so, what type? (NEIWPCC, p. 3)
  
  
  
  
  
  
  
  
  
  
4. What might cause even non-sparking tools to be unsafe? (NEIWPCC, p. 3)
  
  
  
  
  
  
  
  
  
  
5. Movement of which of the following causes static electricity: liquids, air, or solids? (NEIWPCC, p. 3)

6. If static-producing movement cannot be eliminated, how can the contractor provide a “safe” discharge of static electricity? (NEIWPCC, p. 3)
  
6. What combustion dangers may pedestrian and vehicle traffic introduce to the closure site? (NEIWPCC, p. 4)
  
7. What should the inspector do if the contractor is unfamiliar with the product stored in the tank? (NEIWPCC, p. 4)
  
8. How can meteorological conditions affect tank closure? (NEIWPCC, p. 4)
  
9. What protective gear should the inspector (and contractor) wear or have available at a tank closure site? (NEIWPCC, p. 4)
  
10. What type of pump should be used to remove product and residue from the tank?  
(NEIWPCC, p. 4)

12. How can electrostatic ignition hazards be reduced when removing product or residue from the tank? (NEIWPCC, p. 4)

1. Why should plastic (PVC) pick-up tubes be avoided on the stripping lines of vacuum trucks? (NEIWPCC, p. 5)

2. Where should the vacuum truck be in relation to the tank when removing liquid or residue from a tank? Where should exhaust hoses be situated relative to the tank? (NEIWPCC, p. 5)

3. Which point of the fire triangle is dealt with in “purging” the potentially explosive atmosphere in a tank? (NEIWPCC, p. 5-6)

4. What is the flammable range of vapor given off by most petroleum products? (NEIWPCC, p. 5-6)

5. Below the lower explosive level (LEL) the mixture of fuel and vapor in a tank is too lean to support combustion. What is the LEL for petroleum products? (NEIWPCC, p. 6)

18. What is the goal of purging? (NEIWPC, p. 6)
6. Which point of the fire triangle is dealt with in “inerting” the atmosphere of a tank?  
(NEIWPC, p. 6)
7. What is the goal of inerting a tank? (NEIWPC, p. 6)
8. Why is it especially important to control sources of ignition when purging an underground tank with air? (NEIWPC, p. 6)
9. What two methods of purging a tank with air are recommended and what method is not recommended? (NEIWPC, pp. 6-7)
10. Which method of purging with air pumps fresh air into the tank and which one draws vapors out of the tank? (NEIWPC, pp. 6-7)



24. Why must the contractor take into account the size of the vent opening and that rate at which air is pumped into the tank when using a diffused air blower? (NEIWPC, pp 6-7)

11. What are the minimum heights above grade and any adjacent roof lines for venting exhaust fumes from purging? (NEIWPC, p. 7)

12. Once a tank has been purged, is there any need to continue monitoring it for flammable vapors? (NEIWPC, p. 8)

13. When testing with a Combustible Gas Indicator (CGI), a reading of 100% LEL would indicate that what percent of gasoline vapors were present? (NEIWPC, p. 8)

14. What range of CGI readings is considered a practical target by the petroleum industry? (NEIWPC, p. 8)

15. Where inside the tank should the CGI probe be placed to take a reading during and after purging? (NEIWPC, p. 8)

30. How often should the CGI instrument be cleared and calibrated? (NEIWPCC, p. 9)

16. What substances can foul or “poison” a probe? (NEIWPCC, pp. 8-9)

17. When inerting a tank with dry ice, how many pounds of dry ice should be used for every 1,000 gallons of tank capacity? (NEIWPCC, p. 9)

18. Why might it take longer to inert a tank using dry ice than nitrogen? (NEIWPCC, p. 9)

19. What hazard should closure personnel be aware of when handling dry ice?  
(NEIWPCC, p. 9)

20. Where in the tank should the gas be introduced when inerting the atmosphere with nitrogen? (NEIWPCC, p. 10)

36. Why should carbon dioxide fire extinguishers not be used for inerting flammable atmospheres? (NEIWPCC, p. 10)

21. Is it likely that a tank that has been inerted still contains flammable vapors? (NEIWPCC, p. 10)

22. When using nitrogen to inert an UST, the hose or nozzle delivering the nitrogen into the UST must be \_\_\_?\_\_\_ to prevent static buildup. (NEIWPCC, p. 10)

23. Do vent heights for inerting differ from the vent heights for purging? (NEIWPCC, p. 7 and p. 10)

24. What readings recorded on an oxygen meter indicate a non-combustible atmosphere in tanks that have contained most petroleum products? What readings should you target for a more conservative safety rule of thumb? (NEIWPCC, p. 11)

25. What percent oxygen by volume indicates a safe range for breathing? (NEIWPCC, p. 11)

42. What type of safety procedures should be followed if a tank must be entered once the inerting process is complete? (NEIWPCC, p. 11-12)
26. What must be done with water that has filled a tank in an attempt to make it safe? (NEIWPCC, p. 12)
27. Should a single point of the fire triangle be the focus of efforts to avoid fire and explosion during a tank closure? (NEIWPCC, p. 12-13)
28. Can a combustible gas indicator be used to monitor a tank which is being inerted? Why or why not? (NEIWPCC, p. 13)
29. What is the definition of “flashpoint”? (NEIWPCC, p. 14)
30. Why do fuel oils present less of an explosion danger than gasoline? (NEIWPCC, p. 14)

48. Should the safety procedures used on tanks storing fuel oils be different for tanks using stored gasoline? Why? (NEIWPCC, pp. 14)
31. Why is it necessary to check the atmosphere in the tank before cleaning it when the tank has already been purged or inerted? (NEIWPCC, p. 14)
32. Why should tanks be cleaned regardless of whether they are to be removed or closed in place? (NEIWPCC, p. 14)
33. If a tank is to be closed in place, what additional benefit does cleaning provide? (NEIWPCC, p. 14)
34. What are the primary safety considerations when deciding if a tank should be cleaned on-site or off-site? (NEIWPCC, p. 14)
35. How should monitoring equipment be prepared before excavation begins at a closure site? (NEIWPCC, p. 16)

54. What is the purpose of a 1/8 inch vent hold in one plug of a “safe”, plugged tank?  
Where should it be positioned during transport? (NEIWPC, p. 16-17)

36. Where is the most dangerous position in relation to a tank if it should  
explode? (NEIWPC, p. 17)

37. What is the procedure for sealing corrosion holes in a tank prior to  
transport? (NEIWPC, p. 17)

38. What are the elements of a safe removal checklist? (NEIWPC, p. 18)

## **API 1604: Closure of Underground Petroleum Storage Tanks**

***(American Petroleum Institute, Third Edition, March 1996, Reaffirmed November 2001)***

*(Study Guide Questions for West Virginia Underground Storage Tank Closure and Change-in-Service Exam)*

1. Who should be familiar with the potential hazards, and be knowledgeable in the appropriate health and safety required for a safe working environment during tank closure activities? (API 1604, Section 1.1)
  
2. What are the symptoms of inhaling high concentrations of petroleum hydrocarbon vapors? (API 1604, Section 1.3.1)
  
3. How can the minor effects of exposure (by inhalation) to petroleum hydrocarbon vapors be treated? (API 1604, Section 1.3.1)
  
4. List six precautions closure personnel should follow to reduce health risks at an UST closure site. (API 1604, Section 1.3.1)

5. What blood disorder is associated with exposure to benzene (gasoline typically contains 1-3% benzene)? (API 1604, Section 1.3.1.1)

1. What component of gasoline (historically) can cause diseases of the nervous system, the kidneys, and the blood? (API 1604, Section 1.3.1.2)

2. During tank closure, flammable and combustible vapors are likely to be present in the work area. What are three precautions that must be taken to reduce the danger of an explosion of fire? (API 1604, Section 1.3.2.1)

3. When securing a tank that is to be placed temporarily out of service, one acceptable method for removing stored product is to drain all lines into the tank and then remove all liquids from the tank. Another method is to remove all flammable or combustible liquids except for approximately four inches. Why are some liquids left in the tank in the second method? (API 1604, Section 2.2)

**Note:** for gasoline, "saturated vapor space" is a way of saying that the concentration of flammable vapors is above the upper flammable limit, and so the vapors cannot burn or explode. According to federal and West Virginia regulations, leak detection procedures must be maintained while a tank is out of service if more than one inch of product is left in the tank.



9. When an underground storage tank has been temporarily out of service for more than 12 months and does not meet EPA standards, identify the two allowable options for that tank. (API 1604, Section 2.1)
4. Which tank openings should be capped and which left open when securing a tank system that is temporarily out of service? (API 1604, Section 2.2)
5. Prior to permanent closure or change in service of an underground tank, a pre-closure evaluation should be conducted. What four things should be determined during this evaluation? (API 1604, Section 3.3.1)
6. If a vacuum truck is used for removal of liquids or residues from an underground tank: (API 1604, Section 4.2.3)
- the area of operation of the vacuum truck must be \_\_\_\_\_
  - the truck should be located \_\_\_\_\_ from the tank.
  - vacuum pump exhaust gases should be discharged through a hose of adequate size and length \_\_\_\_\_ of the truck and tank area.
13. Once the top of the tank has been excavated for removal or closure in place and tank fixtures removed, all tank openings should be plugged except one. Which opening should remain open until the tank is purged? (API 1604, Section 4.2.5)

14. Testing of the tank atmosphere for flammable and combustible liquids should be regularly conducted until \_\_\_\_\_? (API 1604, Section 4.4.1)

1. At what levels in the tank should readings with a combustible gas indicator be taken?  
What should be done if the tank is equipped with a non-removable fill tube?  
(API 1604, Section 4.4.2)

2. Under what circumstances may combustible gas indicator readings recorded from tank atmospheres be misleading?  
(API 1604, Section 4.4.3)

3. Which is preferred, "tank removal" or "closure in place"? (API 1604, Section 4.5.1)

4. When should "closure in place" be considered? (API 1604, Section 4.5.1)

5. When closing a tank in place, should the vent line be disconnected once the tank is full of inert material? (API 1604, Section 4.5.6)

20. With what information should a tank scheduled to be removed from the closure site be labeled? What is the recommended size of letters on a tank label?  
(API 1604, Section 4.6.4)
5. What procedures should be followed when storing a used petroleum UST? What type of storage facility is desirable? (API 1604, Section 5.2.1, 5.2.2)
6. When can tanks that previously contained gasoline be used for the storage of food or liquids intended for animal or human consumption? (API 1604, Section 6.1.2)

**API 2016 — "Guidelines and Procedures for Entering and Cleaning  
Petroleum Storage Tanks" (American Petroleum Institute, First  
Edition, August 2001, Reaffirmed May 1, 2006)**

*(Study Guide for West Virginia Underground Storage Tank Closure and Change-in-Service  
Exam)*

6. According to API 2016 and regarding confined spaces, what is the responsibility of an "attendant"? (Section 3.2.1)
  
  
  
  
  
  
  
  
  
  
7. According to API 2016 and regarding confined spaces, what function does an "entrant" serve? (Section 3.2.15)
  
  
  
  
  
  
  
  
  
  
8. What characteristics make a location a "confined space"? What characteristics make the location a "permit-required confined space"? (Section 3.2.8.1)
  
  
  
  
  
  
  
  
  
  
9. What conditions apply to a Class I, Zone 0 location? (Section 3.2.12.1)

6. According to API 2016, what conditions are considered a "hazardous atmosphere"? (Section 3.2.26)
  
7. API 2016 identifies hazards a person may not likely encounter during tank entry and cleaning. What are they? (Section 4.1)
  
8. Conditions within tanks can lead to oxygen deficient or oxygen enriched atmospheres. What is the normal ambient oxygen content of air? (Section 4.2.1)
  
9. Vapors from liquid hydrocarbons can displace air within a tank because \_\_\_\_\_ they're (Section 4.2.2)
  
10. API 2016 warns of the potential hazard of "channeling" to occur in a large tank during ventilation of hazardous vapors. Define "channeling"? (Section 4.2.2.4)

10. A petroleum tank has been checked for oxygen levels before entering and found to contain 19% oxygen. What is required for an entrant to use in order to safely enter the tank? (Section 4.2.3.1)

11. What is the approximate explosive (flammable) range (volume percent in air) of gasoline? (Section 4.3.3, see Table 4-1)

10. What are potential ways that a toxic substance can enter the body of a worker? (Section 4.4.2)

11. Older gasoline tanks being cleaned have the potential for the presences of organic lead compounds. Where in the tank would the primary source of organic lead be most likely present? (Section 4.4.5.2)

12. The potential for "stress" exposure exists while performing tank cleaning activities, including heat and cold stress. Can heat stress occur when the air temperature is 72 degrees F? If so, how? (Section 4.5.1.4)

15. Numerous physical hazards may potentially exist when performing tank cleaning activities. Identify potential physical hazards listed in API 2016.  
(Section 4.6.1)

13. API 2016 recommends the "normal" amount of fresh air required to ventilate a tank after de-gassing and while workers are inside is "5 air changes per hour". This means replacing the volume of air in the tank how often? (Section 5.1)

14. Mechanically introducing fresh air into a tank is considered by API 2016 to be the preferred method of removing vapors from a tank, using either eductors or air blowers. API 2016 also states that \_?\_ is the preferred and safest method of operating blowers and eductors. (Section 5.3.1, see 5.3.1.1)

1. When removing vapors from a tank, eductors and air blowers are to be electrically bonded to the tank. Why? (Section 5.3.2.1)

2. When determining the appropriate number, capacity and location of air blowers and eductors to be used during tank cleaning activities, which of the following factors must be considered? (Section 5.3.3)

20. A 6,000 gallon tank is determined to have nearly 45,000 cubic feet of space. Assuming one blower is used (100% blower efficiency and no airflow obstructions) to introduce fresh air into the tank with a capacity rating of 9,000 cubic feet per minute, how long would it take for one air change (displace the volume of the tank) to occur?  
(Section 5.3.3.1, based on example 5.1)

1. While a worker is inside a gasoline tank performing cleaning activities, the LEL is monitored and has exceeded 10%. What should immediately occur next?  
(Section 6.6.2.4)

2. API 2016 states that artificial lighting equipment can be used during tank cleaning activities, provided it meets what criteria? (Section 9.4.2.2)

7. When performing tank cleaning activities, why is it important to monitor weather conditions in the area for potential lightning? (Section 9.6)

8. A tank cleaning crew includes a person that smokes. Where is he allowed to smoke? (Section 9.9)



25. API 2016 recommends use of a Tank Cleaning Checklist for safe tank cleaning operations. What should be included in this checklist? (Section 10.1)

9. MSDSs (Material Safety Data Sheets) should be reviewed as part of a hazards analysis and protection requirements exercise before initiating tank cleaning activities. According to API 2016, what will the MSDS help with? (Section 10.2.2)

10. API 2016 states that a ? plan should be developed for each tank being cleaned that provides information on what to do in case of an emergency.  
(Section 10.2.9)

11. When removing remaining tank product prior to cleaning and a portable air-driven suction pump is used, what does API 2016 recommend the pump be grounded and bonded to? (Section 10.3.4)

12. When testing for flammable vapors, API 2016 states that the amount of oxygen in the atmosphere must be between ? and ? for combustible gas indicators to operate properly. (Section 11.2.2.2)

30. When purging a tank, API 2016 provides three reasons why the oxygen level within the tank must be measured. What are they? (Section 11.2.2.3)

1 .

2 .

3 .

31. Combustible gas indicators are used to determine the amount of ? ? in the atmosphere. (Section 11.3.2)

12. API 2016 cautions that catalytic filament combustible gas indicators must be calibrated with the appropriate calibration gas for the hydrocarbon vapors to be tested. Why? (Section 11.3.2.5)

13. API 2016 cautions that combustible gas indicators are not to be used to measure toxic substances. Why? (Section 11.4.1.1)

## **"Working in Confined Spaces"**

**(National Institute for Occupational Safety and Health {NIOSH}, December 1979,  
Publication 80-106)**

*(Study Guide Questions for West Virginia Underground Storage Tank Closure and Change-in-Service  
Exam)*

13. What are the three conditions that NIOSH uses to define a "confined space"? (NIOSH, p. 1)

14. What is the NIOSH definition of a "Class A" confined space? (NIOSH, p. 1)

15. What is the NIOSH definition of a "Class B" confined space? (NIOSH, p. 1)

16. What is the NIOSH definition of a "Class C" confined space? (NIOSH, p. 1)

17. What is the NIOSH definition of hot work? (NIOSH, p. 2)

6. What is the NIOSH definition of "lower flammable limit"? (NIOSH, p. 2)

15. What is the normal percentage of oxygen in the air at sea level? (NIOSH, p. 2)

16. What is the NIOSH definition of "qualified person" as defined by NIOSH? (NIOSH, p. 2)

17. What is the NIOSH definition of a standby person? (NIOSH, p. 3)

18. Below what percentage of oxygen is a confined space atmosphere rated as Class A? (NIOSH, p. 4)

19. Between what percentages of oxygen is a confined space atmosphere rated as Class B? (NIOSH, p. 4)

12. Between what percentages of oxygen is an atmosphere rated as Class C? (NIOSH, p. 4)
13. Above what percentage of the lower flammability limit (LFL) is an atmosphere rated as Class A? (NIOSH, p. 4)
14. Between what lower flammability limit (LFL) percentage is an atmosphere rated as Class B? (NIOSH, p. 4)
15. Below what lower flammability limit (LFL) percentage is an atmosphere rated as Class C? (NIOSH, p. 4)
16. For which classes of confined space work is a permit from a qualified person required before the space is entered? (NIOSH, p. 5)
17. For which classes of confined space work is atmospheric testing required before the space is entered? (NIOSH, p. 7)

18. For which classes of confined space is training of personnel required before performing confined space entry work? (NIOSH, p. 5)
  
3. For which classes of confined space entry is a trained standby person required? What piece of equipment must this standby person have at hand? (NIOSH, p. 6)
  
4. Who's responsible for securing/completing a confined space entry permit? (NIOSH, p. 6)
  
5. For what length of time is a confined space entry permit valid? (NIOSH, p. 7)
  
6. For which classes of confined space entry must there always be someone readily available who is currently trained in cardio-pulmonary resuscitation (CPR) and basic first aid procedures? (NIOSH, p. 8)
  
7. Who is responsible for training personnel and for the safety of the entire confined space entry procedure? (NIOSH, p. 8)

24. Before entering the confined space, what three types of tests must be made to insure that the atmosphere is safe? (NIOSH, p. 9)
14. Hot work is prohibited whenever the atmosphere in the confined space is greater than what percent of the LFL? What additional measurement must be made to be sure that the flammability measurement is correct? (NIOSH, p. 9)
15. Below what percentage of oxygen in a confined space must approved respiratory equipment be used? (NIOSH, p. 10)
16. What are four type of personal protective equipment normally used to protect employees against traumatic injury in confined spaces? (NIOSH, p. 11)
17. What is the result of trying to breathe in an atmosphere where oxygen has been completely displaced by nitrogen? (NIOSH, p. 27)
18. What are the physiologic (physical) effects of breathing in an atmosphere that contains 17% oxygen? (NIOSH, p. 27)

**Occupational Safety and Health Standards, Safety and Health  
Regulations for Construction, "Excavations"  
(Standard Number 1926 Subpart P)**

*(Study Guide Questions for West Virginia Underground Storage Tank Closure and Change-in-Service Exam)*

18. What is the scope and application of the OSHA Subpart P ("Excavations") regulations? (OSHA, Section 1926.650(a))

19. What is the definition of "benching"? (OSHA, Section 1926.650(b))

20. What is meant by "competent person" in the OSHA regulations? (OSHA, Section 1926.650(b))

21. What is the definition of "sloping"? (OSHA, Section 1926.650(b))

22. What is the general definition of trench? If a structure (such as a tank) is installed in an excavation so that the distance between the tank and the side of the excavation is less than 15 feet, is the excavation considered to be a trench? (OSHA, Section 1926.650(b))



6. When must the location of underground installations be determined?  
(OSHA, Section 1926.651(b)(1))

23. A stairway, ladder, or ramp must be located in trench excavations whenever the depth of the excavation is \_\_?\_\_ feet or more. The stairway, ladder, or ramp shall be located so that no more than \_\_?\_\_ feet of lateral travel is required to reach it.  
(OSHA, Section 1926.651(c)(2))

24. What are two conditions where a hazardous atmosphere could reasonably be expected to exist in an excavation? (OSHA, Section 1926.651(g)(1)(i))

25. When oxygen levels are below \_\_\_\_\_ percent, precautions must be taken to protect employees. (OSHA, Section 1926.651(g)(1)(ii))

26. Employees should not be exposed to atmospheres where the concentration of a flammable gas is greater than what percent of the lower flammable limit?  
(OSHA, Section 1926.651(g)(1)(iii))

27. What emergency rescue equipment should be present whenever hazardous atmospheric conditions exist or may reasonably be expected to develop? (OSHA, Section 1926.651(g)(2)(i))

12. What three types of precautions might need to be taken to protect employees in excavations in which there is water accumulation? (OSHA, Section 1926.651(h)(1))
19. In order to protect employees from excavated materials or any other materials or equipment that might fall or roll into an excavation, how far back from the edge of the excavation must materials or equipment be kept? (OSHA, Section 1926.651(j)(2))
20. Each employee in an excavation shall be protected from cave-ins by an adequate protective system unless:
- The excavation is made entirely in what type of material?  
(OSHA, Section 1926.652(a)(1)(i))
  - The excavation is less than \_?\_ feet deep, and examination by \_\_\_\_\_ provides no indication of a potential cave-in.  
(OSHA, Section 1925.652(a)(1)(ii))
15. What are the four categories of soil and rock deposits in the OSHA soil classification system? How are these categories determined? (OSHA, 1926 Subpart P, Appendix A)
21. Who must classify soil and rock deposits that are to be excavated (OSHA, 1926 Subpart P, Appendix A)

17. Distressed soil is soil in a condition where a cave-in is imminent or is likely to occur. What are five indications that soil is distressed? (OSHA, 1926 Subpart P, Appendix B)
- 3.
  - 4.
  - 5.
  - 6.
  - 7.
18. What is the maximum allowable simple slope for an excavation made in Type A soil that is 20 feet or less in depth? (OSHA, 1926 Subpart P, Appendix B, Figure B-1.1)
19. What is the maximum allowable simple slope for an excavation made in Type B soil that is 20 feet or less in depth? (OSHA, 1926 Subpart P, Appendix B, Figure B-1.2)
20. What is the maximum allowable simple slope for an excavation made in Type C soil that is 20 feet or less in depth? (OSHA, 1926 Subpart P, Appendix B, Figure B-1.3)
21. If a soil is not classified by a competent person, what must be the slope of the excavation if protection from cave-ins by sloping the walls of the excavation is to be provided? (OSHA, 1926 Subpart P, Appendix F, Figure 2)

## **Occupational Safety and Health Standards, Subpart J — General Environmental Controls, "Permit Required Confined Spaces" (Standard Number 1910.146)**

*(Study Guide Questions for West Virginia Underground Storage Tank Closure and Change-in-Service Exam)*

1. Define "confined space" per OSHA 1910.146 guidelines. (OSHA 1910.146 (b))
  
2. Identify the potential causes for a "hazardous atmosphere", according to OSHA 1910.146. (OSHA 1910.146 (b))
  
3. According to OSHA 1910.146, what are the responsibilities of an "entry supervisor"? (OSHA 1910.146 (b))
  
4. Identify the potential characteristics of a "permit-required confined space". (OSHA 1910.146 (b))

5. Per OSHA 1910.146 guidelines, when is a written permit space program required? (OSHA 1910.146 (c)(4))
  
1. Per OSHA 1910.146 guidelines, what must the internal atmosphere of a confined space be tested for before entry is allowed?  
(OSHA 1910.146 (c)(5)(ii)(C))
  
1. Per OSHA 1910.146 guidelines, when using forced air ventilation in a confined space, how long must air ventilation continue?  
(OSHA 1910.146 (c)(5)(ii)(E)(2))
  
2. According to OSHA 1910.146 guidelines, in the event a hazardous atmosphere is detected in a confined space while occupied by an employee, what must the employee in the confined space immediately do? (OSHA 1910.146 (c)(5)(ii)(G)(1))
  
3. Per OSHA 1910.146 guidelines, list the equipment that the employer is required to make available to employees for entering a confined space.  
(OSHA 1910.146 (d)(4)(i) through (ix))

10. Under OSHA 1910.146 guidelines for entry of confined spaces, when is an "attendant" required?  
(OSHA 1910.146 (d)(6))
  
1. According to OSHA 1910.146, when can entry permits be cancelled? (OSHA 1910.146 (e)(5)(i) and (e)(5)(ii))
  
2. OSHA 1910.146 states that cancelled entry permits must be retained by the employer for how long? (OSHA 1910.146 (e)(6))
  
3. According to OSHA 1910.146, what information is required to be identified on an entry permit? (OSHA 1910.146 (f)(1) through (f)(14))
  
4. According to OSHA 1910.146, when are employers required to provide training to employees on confined space entry?  
(OSHA 1910.146 (g)(2)(i) through (g)(2)(iv))

15. According to OSHA 1910.146, what are the duties of the "attendant"? (OSHA 1910.146 (9)(1) through (9)(10))
  
  
  
  
  
  
  
  
  
  
4. According to OSHA 1910.146, what are the duties of the "entry supervisor"? (OSHA 1910.146 a(1) through (j)(6))
  
  
  
  
  
  
  
  
  
  
5. According to OSHA 1910.146, when working in confined spaces, when are mechanical devices designed to retrieve personnel required?  
(OSHA 1910.146 (k)(3)(ii))
  
  
  
  
  
  
  
  
  
  
6. According to OSHA 1910.146, at least one person on the identified rescue team must hold a current certification in what two health-related areas?  
(OSHA 1910.146 (k)(2)(iii))

## **West Virginia Underground Storage Tank Rule “Title 33 Series 30”**

*(Study Guide Questions for West Virginia Underground Storage Tank Closure and Change-in-Service Exam)*

11. To whom do the requirements of section 3 of the West Virginia rules apply? (WV, Section 33-30-3)
  
  
  
  
  
  
  
  
  
  
12. After December 31, 1994, what qualifications must the person “exercising supervisory control over the change-in-service or closure” of an underground tank have? (WV, Section 33-30-3.2)
  
  
  
  
  
  
  
  
  
  
13. During what parts of the tank change-in-service or closure process is a certified person required to be present? (WV, Section 33-30-3.2.a.4)
  
  
  
  
  
  
  
  
  
  
14. What categories of underground tank work will a Class B certificate allow an individual to perform? (WV, Section 33-30-3.3.b)
  
  
  
  
  
  
  
  
  
  
15. What categories of underground tank work will a Class C certificate allow an individual to perform? (WV, Section 33-30-3.3.c)



6. Can a business or corporation be certified to do underground tank work in West Virginia? (WV, Section 33-30-3.4a)
16. Must a person be a resident of West Virginia in order to be certified to do tank work in West Virginia? (WV, Section 33-30-3.4.b)
17. How many references must an applicant for certification provide to the director of the DEP as part of the demonstration of ethical practice? (WV, Section 33-30-3.4c)
18. How many years experience in underground tank work must an applicant for certification have? What type of university or college degrees can substitute for the required degrees? (WV, Section 33-30-3.4d)
19. What is the passing score on the certification examination? (WV, Section 33-30-3.5)
20. How much is the certification examination fee? (WV, Section 33-30-3.4.f)



12. When do certificates and certificate renewals expire? (WV, Section 33-30-3.5)
39. How much is the certificate renewal fee? By what date must the renewal fee be paid? (WV, Section 33-30-3.5)
40. What happens if your certificate expires before you apply for renewal? (WV, Section 33-30-3.5)
41. How many hours of continuing education training are required in order to renew certification? (WV, Section 33-30-3.5.a.2)
42. How can a certificate be renewed without completing any continuing education training? (WV, Section 33-30-3.5.a3)
43. What will certified underground tank workers be given to demonstrate that they are certified? (WV, Section 33-30-3.6)

18. What are eight possible reasons for denying certification? (WV, Section 33-30-3.7.a)

# **Code of Federal Regulations 40 CFR Part 280 "Technical Standards and Corrective Requirements for Owners and Operators of Underground Storage Tanks (UST)"**

*(Study Questions for West Virginia Underground Storage Tank Closure and Change-in-Service Exam)*

28. UST's placed in temporary closure, after 12 months, can apply for an extension of temporary closure status to the WVDEP. What must be completed in order for an extension to be granted? (40 CFR 280.70)
29. How long before an UST system is to be permanently closed must the West Virginia DEP be notified if the closure is not in response to corrective action? (40 CFR 280.71)
30. How long before an UST system is to have a change-in-service must the West Virginia DEP be notified if the change-in-service is not in response to corrective action? (40 CFR 280.71)
31. What must be done in order to permanently close a tank? (40 CFR 280.71)

5. What must be done in order for an UST to have a change-in-service occur? (40 CFR 280.71)

32. What is meant in the rules by the term "change-in-service"? (40 CFR 280.71)

33. When permanently closing an UST, where must an owner or operator measure for the presence of a release? (40 CFR 280.72)

**West Virginia Department of Environmental Protection, Permanent Petroleum Tank Closure" Memorandum (February 16, 1989, Revised January 1, 2002, Revised February 4, 2013) and OER's Reporting and Managing Contaminated Soils During Tank Closure Memorandum**  
(Study Guide Questions for West Virginia Underground Storage Tank Closure and Change-in-Service Exam)

20. The WV Permanent Petroleum Tank Closure memorandum states that an individual holding a West Virginia DEP ?\_ certification must be on site supervising the tank closure or change-in-service. (WV Tank Closure Memo, page 1)
21. According to the WV Permanent Petroleum Tank Closure memorandum, at least ? days before beginning either permanent closures or change-in-service of a UST, written notification must be submitted to the appropriate UST inspector. (WV Tank Closure Memo, page 1)
22. What can be done with the contents of a petroleum underground tank that the WVDEP considers to be "legitimate" recycling? (WV Tank Closure Memo, page 1)
23. If gasoline removed from an UST is to be reused as a fuel, what are the six conditions that must be met? (WV Tank Closure Memo, page 2)





5. If tank contents are not being reused or recycled, what are the two allowable options regarding determining whether the material is a hazardous waste? (WV Tank Closure Memo, page 2)
24. When UST contents have been determined to be hazardous, a Hazardous Waste EPA Identification Number must be obtained from the WVDEP, if the site doesn't have one, in order to properly ship hazardous waste off-site. What information is required in order to obtain this identification number? (WV Tank Closure Memo, page 2)
7. The WV Permanent Petroleum Tank Closure Memorandum states, when closing or performing a change-in-service on an UST, the tank and piping must be emptied, and the tank must be purged of flammable vapors or inerted. What API document is recommended to be followed to perform these activities? What API document should be followed for tank cleaning? (WV Tank Closure Memo, page 3)
34. The WV Permanent Petroleum Tank Closure Memorandum states, when closing or performing a change-in-service on an UST, the tank must be cleaned. After tank cleaning, what should be done with the tank?  
(WV Tank Closure Memo, page 3)

9. What does the WV Permanent Petroleum Tank Closure Memorandum state is the simplest method of removing material remaining at the bottom of a tank ("tank bottoms")? (WV Tank Closure Memo, page 3)
25. What EPA laboratory tests must be performed on soil and/or groundwater samples collected during a site assessment at tank closure? (WV Tank Closure Memo, page 3)
26. Who must certify a laboratory that is testing samples from a tank closure site assessment? (WV Tank Closure Memo, page 3)
27. Soil and groundwater samples collected as part of an UST closure assessment for laboratory testing are to be kept at \_\_?\_\_ degrees F (Fahrenheit), and must be analyzed within \_\_?\_\_ days. (WV Tank Closure Memo, page 3)
28. What form must accompany samples being sent to a laboratory for testing as part of an UST closure assessment? (WV Tank Closure Memo, page 3)

14. Soil and groundwater samples collected as part of an UST closure assessment for laboratory testing are to be collected from any areas that displays obvious contamination from an UST release. At a minimum, what other samples must be collected in the vicinity of the UST's? (WV Tank Closure Memo, page 3)

15. When performing an UST closure assessment and collecting samples for laboratory testing, how many samples, at a minimum, are to be collected at each product dispenser and along the product piping? (WV Tank Closure Memo, page 3)

35. If evidence of a petroleum release is discovered during an UST removal or change-in-service, who must be notified, and within what time frame?(OER Reporting and Managing Contaminated Soils during Tank Closures, Page 1)

29. When performing an UST closure and a minor amount of soil contamination is discovered, it can be treated on-site in an aboveground bio-pile, as long as the bio-pile does not exceed what size? (OER Reporting and Managing Contaminated Soils during Tank Closures, Page 2)

30. Describe how a bio-pile should be constructed if one is used when performing an UST closure?  
(OER Reporting and Managing Contaminated Soils during Tank Closures, Page 2)

19. Six months after a bio-pile was created from closure of an UST, a petroleum odor was still present; therefore the bio-pile shall continue to be maintained. After another six-month period, what must occur?

(OER Reporting and Managing Contaminated Soils during Tank Closures, Page 2)

22. When sampling a bio-pile, a representative sample should be collected from what location of the bio-pile?

(OER Reporting and Managing Contaminated Soils during Tank Closures, Page 2)

23. Laboratory analysis of bio-pile samples generated from a UST closure must be sent to the WVDEP's Office of Environmental Remediation Project Manager for the county where the facility is located. How must the submitted analysis reports be identified?

(OER Reporting and Managing Contaminated Soils during Tank Closures, Page 2)

24. In the event a release has been discovered during closure of a UST, and contaminated soil cannot be treated on-site, either due to lack of space or above allowable amounts to be treated in a bio-pile, no additional excavation of contaminated soils may proceed until what document is submitted to WVDEP's Office of Environmental Remediation?

(OER Reporting and Managing Contaminated Soils during Tank Closures, Page 2)

25. Where should all of the UST closure documents be sent?

(WV Tank Closure Memo, page 4)

24. Results of the excavation zone assessment must be maintained by the UST owner/operator for at least        years after completion of the permanent closure, or can be mailed to the WVDEP's Office of Waste Management, UST Unit if they cannot be maintained at the closed facility. (WV Tank Closure Memo, page 4)